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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,572	09/27/2006	Tamotsu Yamamoto	2006_1635A	6597

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EXAMINER

YABUT, DANIEL D

ART UNIT

PAPER NUMBER

3656

NOTIFICATION DATE

DELIVERY MODE

05/04/2012

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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# Office Action Summary

**Application No.**

10/594,572

**Applicant(s)**

YAMAMOTO ET AL.

**Examiner**

DANIEL YABUT

**Art Unit**

3656

**Period for Reply** -- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 February 2012.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 5) ☒ Claim(s) 1,4,11 and 15-19 is/are pending in the application.
- 5a) Of the above claim(s) 16 and 17 is/are withdrawn from consideration.
- 6) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 7) ☒ Claim(s) 1,4,11,15,18 and 19 is/are rejected.
- 8) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 9) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 10) ☒ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-SB08)  
Paper No(s)/Mail Date \_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_

## **DETAILED ACTION**

### **Specification**

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The terms "first portions" and "second portions" recited in line 3 of claim 1 lack proper antecedent basis in the written description.

### **Claim Objections**

Claims 4 and 15 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claims 4 and 15 recite the limitation "wherein a hardness of the inner hole of the cam piece is higher than a hardness of the outer circumferential surface of the shaft." However, the respective parent claims recite the limitation "said inner walls being harder than said outer circumferential surface of said shaft" regarding the "rotating member" which is later deemed as a "cam piece." As such, claims 4 and 15 fail to further limit the subject matter of the respective parent claims.

Applicant is advised that should claim 1 be found allowable, claim 11 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

**Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4, 11, 15, 18 and 19 rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto (Japanese Patent JP2003184994A) in view of Takeda (US Patent 4,968,292) and in view of Arnold et al. (US Patent 5,207,120; Arnold hereafter).

Yamamoto discloses a rotating assembly (Fig. 1) comprising a(n):

Re claim 1

- Shaft (10) having an insertion portion (near 11; Fig. 4) and an outer circumferential surface (at 10; Fig. 4), said outer circumferential surface including first portions (13) and second portions (recesses at numeral 12 in Fig. 2) adjacent said first portions, said first portions being deformable so as to be raised outward when a force is applied to said second portions (§ [0017]- [0018])
- Rotating member having an inner hole (at numeral 23 in Fig. 5A) with inner walls and outer walls (at numerals 23 and 24b in Fig. 10b), said inner hole having a diameter measured between opposed inner walls of said inner walls smaller than an outer diameter of said inner insertion portion of said shaft (see inner walls at numeral 23 in Fig. 4 smaller in diameter compared to outer surface at numeral 13; § [0015] ll. 1-6), said rotating member being fixed to said shaft by inserting said shaft into said inner hole in an insertion direction (§ [0017]-[0019])

- Plurality of grooves (24) in areas opposite to said first portions of said outer circumferential surface, said grooves extending in the insertion direction (24; Fig. 6)
- After the diameter of said inner hole is expanded by heating said rotating member, said shaft is inserted into said inner hole and said rotating member is cooled to reduce the diameter of said inner hole, and said inner walls press said second portions of said outer circumferential surface such that said first portions are raised and inserted in said so that said rotating member is fixed to said shaft and formed (§[0017]-[0019]);  
Note: Regarding this limitation, the MPEP states, "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process". See MPEP 2113.
- Rotating member is a cam piece (20) having an outer circumferential surface (at 22; Fig. 4) with a portion of said outer circumferential surface of said rotating member having a cam profile (Fig. 4), said cam profile extending from a first location on said outer circumferential surface of said rotating member to a second location on said outer circumferential surface of said rotating member (left and right hand sides of rotating member in Fig. 3)
- First and second portions (crevices at left and right hand sides at numerals 24 in Fig. 3) in said inner hole are disposed radially inward of said first and second locations, respectively, so that said first and second portions are radially opposed to each

other ([0015] ll. 6-9), and said first and second portions are configured to prevent contact with said outer circumferential surface of said shaft when the rotating member is fixed to said shaft (see gap between faces 24B and 13B in Fig. 5B)

- First and second portions extend through an entire thickness of said rotating member (24 in Fig. 7)

Yamamoto does not expressly disclose the inner walls being harder than said outer circumferential surface of said shaft.

Arnold teaches the hardness of an inner hole of a cam piece being higher than the hardness of an outer circumferential surface of driving shaft (col. 4 ll. 49-55) for the purpose of assuring that the insertion portion conforms with the inner hole upon installation (col. 4 ll. 52-53).

It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Yamamoto to incorporate the inner walls being harder than said outer circumferential surface of said shaft, as taught by Arnold, for the purpose of assuring that the insertion portion conforms with the inner hole upon installation.

Yamamoto does not expressly disclose the first and second portions being first and second large-diameter escape portion.

Takeda teaches first and second portions being first and second large-diameter escape portions (41) for the purpose of promoting the ease of reassembly (col. 3 ll. 53-64).

It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the first and second portions of Yamamoto to be first and second portions

being first and second large-diameter escape portions, as taught by Takeda, for the purpose of promoting the ease of reassembly.

Regarding 1 further, Yamamoto as modified above does not expressly disclose the escape portion having a circumferential length that is at least equal to a circumferential length of two adjacent grooves of said plurality of grooves.

It would have been obvious to one having ordinary skill in the art at the time of the invention to provide the escape portion having a circumferential length that is at least equal to a circumferential length of two adjacent grooves of said plurality of grooves, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See MPEP 2144.05.

Yamamoto as modified above further discloses the following:

Re claim 4

- Hardness of the inner hole of the cam piece being higher than the hardness of the outer circumferential surface of the driving shaft (col. 4 ll. 49-55; Arnold)

Re claim 11

- Shaft (10) having an insertion portion (near 11; Fig. 4), said insertion portion having an outer diameter and an outer circumferential surface (at 10; Fig. 4), said circumferential surface including first portions (13) and second portions (at numeral 12 in Fig. 2) adjacent to said first portions
- Rotating member having a plurality of grooves (24) and an inner hole (near 23; Fig. 3) with inner and outer walls (at numerals 23 and 24b in Fig. 10b), said inner walls being harder than said outer circumferential surface of said shaft (Arnold), and saidd

- inner hole having a diameter that is smaller than the outer diameter of said insertion portion, and said rotating member is being fixed onto said shaft by inserting said shaft into said inner hole of said rotating member in an insertion direction ([0015] / L1-6)
- Plurality of grooves (24) extending in the insertion direction, said plurality of grooves being positioned on said inner hole in areas opposite said first portions of said outer circumferential surface
  - After the diameter of said inner hole is expanded by heating said rotating member, said shaft is inserted into said inner hole, and said rotating member is cooled to reduce the diameter of said inner hole, wherein said inner walls press said second portions of said outer circumferential surface such that said first portions are raised and inserted into said plurality of grooves so that the said inner hole is fixed to said outer circumferential surface of said insertion portion and formed ([0017-19]); Note: See above regarding MPEP 2113.
  - Rotating member is a cam piece (20) having an outer circumferential surface with a portion of said outer circumferential surface of said rotating member having a cam profile, said cam profile extending from a first location on said outer circumferential surface of said rotating member to a second location on said outer circumferential surface of said rotating member (left and right hand sides of rotating member 20; Fig. 3)
  - First and second large-diameter escape portions (crevices at left and right hand sides at numerals 24 in Fig. 3) in said inner hole are disposed radially inward of said first and second locations, respectively, and said first and second large-diameter escape



portions are radially opposed to one another (§[0015] ll. 6-9) and are configured to prevent contact with said outer circumferential surface of said shaft when the rotating member is fixed to said shaft (see gap between faces 24B and 13B in Fig. 5B)

- Each of said first and second escape portions have a circumferential length that is at least equal to a circumferential length of two adjacent grooves of said plurality of grooves (see above regarding workable ranges; MPEP 2144.05)
- First and second escape portions extend through an entire thickness of said rotating member (24 in Fig. 7)

Re claim 15

- Hardness of the inner hole of the cam piece being higher than the hardness of the outer circumferential surface of the driving shaft (col. 4 ll. 49-55; Arnold)

Re claim 18

- Each of said plurality of grooves is formed in a trapezoidal shape (at 24a; § [0015] ll. 14).

Re claim 19

- Each of said plurality of grooves has one of a trapezoidal shape, a circular shape, and a triangular shape (at 24a; § [0015] ll. 14).

### **Response to Arguments**

Applicant's arguments filed 4/21/2011 have been fully considered but they are not persuasive.

Applicant argues that Yamamoto fails to disclose that first portions are deformable so as to be raised outward when a force is applied to second portions, and that inner walls press the

second portions of the outer circumference such that first portions are raised and inserted in the grooves so that the rotating member is fixed to the shaft. In response, Yamamoto discloses in ¶ [0019]:

In a compound camshaft of this embodiment, and a manufacturing method for the same as mentioned above, Since [sic] the convex part 13 is formed in the perimeter of the shaft body 10 and it was mde to make the convex part 13 fit into the crevice 24 of the boss 23 of the cam piece 20, Even [sic] if the amount of diameter expansion deformation of shaft body 10 self in bulging is small, the joint cost of the convex part 13 and the crevice 24 will be secured greatly, and can combine the shaft body 10 and the cam piece 20 firmly.

This passage provides direct support that Yamamoto indeed discloses that first portions are deformable so as to be raised outward when a force is applied to second portions, and that inner walls press the second portions of the outer circumference such that first portions are raised and inserted in the grooves so that the rotating member is fixed to the shaft. Applicant's argument is deemed as unpersuasive.

Applicant argues that Takeda does not teach escape portions 41 being radially opposed to each other. In response, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). As described above, Yamamoto indeed teaches first and second portions (crevices at left and right hand sides of rotating member 20 at numerals 24 in Fig. 3) being radially opposed to each other. Takeda teaches the modification of said first and second portions to be first and second large-diameter escape portions for the added benefit of ease of reassembly. Additionally, Applicant has not set forth support as to how the term broadest reasonable interpretation of the

phrase "radially opposed" does not encompass "three equally spaced-positions" as argued by Applicant. Applicant's argument is deemed as unpersuasive.

In response to applicant's argument that there is no teaching, suggestion, or motivation to combine the references, the examiner recognizes that obviousness may be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988), *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992), and *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398, 82 USPQ2d 1385 (2007). In this case, Takeda provides a teaching to modify Yamamoto involving the first and second portions being first and second large-diameter escape portions (41) for the motivation of promoting the ease of reassembly (col. 3 ll. 53-64).

### **Conclusion**

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL YABUT whose telephone number is (571)270-5526. The examiner can normally be reached on Monday through Friday from 9:00 A.M. to 5:00 P.M. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard W. Ridley can be reached on (571)272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Richard WL Ridley/  
Supervisory Patent Examiner, Art Unit 3656